# USACF NEWSLETTER

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**USACF NEWSLETTER**
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Every top-notch faceter has done a lot of experimenting. Curiosity, and a desire to learn are the prime factors in the making of a master faceter.


**The USACF Newsletter** is a quarterly publication of the USA Competition Faceters.

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## New Members

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**Have you paid your 1993 dues ? If not, this is the last newsletter you will receive. Please make out your $25 check to Lillian Hettich. See Treasurer at left. Before sending read the important article on the opposite page.**

## International Rules

The Australian Faceters Guild has appointed Rupert Pickrell to correspond with your editor on the creation of a set of international rules. Please do not feel this is my job. You Cup Challenge competitors are the ones who will have to live with the rules we agree on, so your input is important. As your corresponder I will, of course, do the best I can, but the more people and ideas that get into active discussion the better the final result will be for you competitors. FVS.

## Notes on Dictionary Addtitons

The inclusion of judging terms on page 6 makes the Faceting Dictionary now cover all the terms defined in our Single-Stone Rules. It is now possible to eliminate the Terms section from those USACF Rules, and simply refer to the Faceting Dictionary as the source for definitions. A motion to make the Faceting Dictionary a supplementary part of the USACF Single-Stone Rules will be submitted for member approval in the near future.

## Where is USACF headed ? (by your Editor)

**Dateline 3/9/93. Last evening I called up some of the other officers of USACF to sound out their feelings about disbanding the USACF.** I know this will come as a shock to some of you, but let me lay it on the line. At present we are going nowhere. We are not following our Constitution--no meetings have been held this year and none are planned. There is an almost total lack of interest among members in the affairs of USACF. There are unfilled Chairman positions. Marion Alden has resigned from Membership Chairman, Charles Hettich has not yet resigned from Sponsor Chairman, but is currently prevented from doing the job by illness, Walter Carss took the job of Cup Chairman on condition that we find a replacement for him in the Secretary job; to date we have not done so. There have been no board of Directors meetings. There is no planning going on for the USACF to sponsor the 1996 Cup Challenge in case the USA wins the 1994 contest. Some of the offices in USACF have never been filled. Our membership has gone from 36 in 1991, to 22 in 1992. Have any of you even asked another faceter to join? At the time of this writing only two of the 1992 members have paid their dues.They were due on January 1, 1993 are were delinquent on March 1,1993. We have decided to send you this newsletter even though you have not paid your dues, in order to bring to your attention the seriousness of our condition.

Your editor has asked for your participation in making decisions important to you, as competitors. In the Feb. 92 newsletter it was brought to your attention that we should settle the problem of tie-breaking in our Single-Stone Rules. No one responded. In the Sept. 92 newsletter the subject of judging Meets was addressed, mainly because several of you were not happy with the way they were judged in Australia. Again, no one responded. If you look at other newsletters you will see articles by various committee chairmen, reports on field trips, meetings, etc. That isn't happening in the USACF. Why? Not interested?

I realize that we are strung out and it is difficult to meet. When we started we all knew it would be difficult to make decisions by mail. Personally, I do not know of any good substitute for face-to-face meetings for ironing out differences and planning our future course. My own feeling is that if we want to keep the USACF together we are all going to have to spend the money to travel to a central meeting place at least once a year, preferably twice, and plan to spend a few days in meetings. AND we are all going to have to commit ourselves to active participation. This last part I find difficult to imagine in view of past performance.

Therefor, I am in favor of disbanding the USACF organization immediately and refunding the bank account on the basis of years of membership. Charles and Lillian Hettich (Treasurer and Sponsor Chairman) agree with me. Norman Steele is not ready to go that route unless it is shown from your response to this article that you are unwilling to step in and assume the vacant Chairman positions with a sincere intent to do what that job requires. Bill Norton does not like the idea of disbanding either. He suggests that we could go on an inactive status, leaving the funds in the bank account, and reactivate later. He suggests that

if the USA team won the 1994 Cup Challenge it might spark enough interest around the country to get contributions and comitted support for our holding the 1996 contest over here. The problem with this is that if we wait until after the 1994 contest results, it will probably be too late to for the USACF to prepare for 1996. However our immediate problem is not the Cup Challenge, it is survival. Your president Norman Steele, Secretary Walter Carss, and Rules and Competition Chairman Bill Norton are all of the opinion that unless there is a sufficient show of willingness by members to step in and help out, there will be no choice but to discontinue the USACF.

If a sufficient show of willingness to work appears, I will continue on as editor for the rest of 1993, after which time I have already planned to step down as an officer in USACF. I will, however, continue on as correspondent with the Australians for international rules--USACF or no USACF.

And so, my fellow members, I am not going to present here a list of questions where you can make a passive "X" in a little box. If you want USACF to continue you are going to have to think, sit down and express your thoughts and intentions in writing. Are you willing to travel to some central place once or twice a year to meet for two days each time? Expect it to cost you some money and time. Consider that it might be done in conjunction with a large show, and can be looked on as a vacation. Put down the Chairmanship you will actively handle. Check your copy of the Constitution for a list. Put down anything you are willing to do. Do you have other ideas? Send your letters to Norman Steele, your president.

**A no-answer is a vote to disband.**

So much for our survival. As to the 1996 Cup Challenge, if the USACF is not going to sponsor it, then we should make it clear to other guilds right away, so that someone else who is interested can pick up the ball and start running. The Midwest Faceting Guild has quite a few of their members cutting for the 1994 contest. Perhaps they would be interested in the 1996 Sponsorship. We must decide. Give your opinion on that problem, too, in your letter.

---

## Here's Who's Filed an Application to Cut for the 1994 Cup Challenge:

Anthony Agnello, Michigan
James D. Berkley, Idaho
Walter L. Carss, Texas
Don E. Dunn, Ohio
Philip Grimm, Ohio
Milton Houston, California
Duane K Luce, Florida
William McVety, Michigan
Hubert M. Rackets, Colorado
Robert S. Stepp, Florida
John Alden, California
Paul C. Billett, Pensylvania
Clifford J. Chapman, Texas
Dick Fairless, Michigan
Charles Hettich, California
Vern Johnson, California
Alston Lundgren, Minnesota
Charles L. Moon, California
Robert Springer, Michigan
Earnest L. Thaxton, Texas
Jim Ball, Oregon
Jerry L. Capps, Wisconson
Tom J. Drawdy, South Carolina
Howard Gerber, California
William J. Horton, Michigan
Glenn Klein, California
Jean A. Marr, North Carolina
Edward C. Myers, Michigan
Norman W. Steele, Washington
Dan Zally, New Jersey

Not all of these will cut all four stones and send them in, but this is an impressive list of starters. Only one woman !

# More Faceting Dictionary

The following are definitions to be added to the USACF Faceting Dictionary:

**Alignment**: The positioning of the crown break facets across from the pavilion break facets, as they are shown on the diagram sheet.

**Angle of Incidence:** A ray striking a facet's surface at 90° has an angle of incidence of zero; its deviation from 90° is its angle of incidence.

**Baguette:** A small step-cut stone, usually set in a row around a larger stone.

**Carat**: A unit of weight. Equals 1/5 of a gram, or 200 milligrams, or 100 points.

**Chip:** A break-out of material from the surface of the stone.

**Critical Angle:** The angle of incidence at which total reflection occurs. At the surface of two differing mediums, usually the gem material and air, if the light ray is below the critical angle of incidence, light will pass from one medium to the other. See Angle of Incidence.

**Dispersion**: The degree to which light passing through the stone is changed into various colors.

**Double Rose Cut:** Same as Rose Cut but having a pavilion which is shallow like the crown and usually is a duplicate of the crown pattern.

**Fisheye:** If the stone is held closely over newsprint which can be read by looking straight down through the table and through the main culet facets, it is a fisheye.

**Flatness:** If a facet is perfectly flat, the entire surface of the facet lies on a single geometrical plane. If any part of the facet curves away from the exact plane, it is called "rounding". If any break line is seen on the facets surface it is not flat.

**Flaws:** These are visible cleavage planes, fractures, inclusions, gas bubbles, etc. If a flaw breaks the surface it becomes a **surface flaw**.

**GVF**: The girdle volume factor; a mathematical constant used to determine the volume of the girdle. Girdle Volume = GVF x W x W x W, based on the girdle thickness being 2% of W. The Volume Factor VF includes the 2% girdle; GVF is used to adjust the volume only if the girdle varies from 2%.

**Gram:** The unit weight of the metric system. One gram = 5 carats = 1000 milligrams.

**Max. CAM Angle:** This is the highest angle usable when making a CAM Preform on an ECED shape which will contain all the pavilion facets; it allows the culet point made to be permanent.

**Max. Cone Angle:** This is the highest angle usable for a cone culet point which will contain the given single CAM angle or set of CAM Preform angles.

**OM, Offset Multiplier:** The number multiplied by the stone width W to obtain the amount of offset for rolled girdle sections.

**Pendeloque:** A pointed pear shape.

**Point:** A unit of weight. Equals 1/100 of a carat.

**Polish:** The smoothness of the surface of a facet. A well-polished facet is free of any unevenness, pitting or grooving, and of all traces of the cutting done by the previous lap.

**Quill:** Part of the faceting machine that holds the dop, also called the dop arm.

**Rose Cut:** A faceted stone having a crown with no table and without a pavilion.

**Scintillation:** The degree of break-up of light passing through a faceted stone into more and smaller flashes of returning light.

**Scratch:** A linear gouging on the facet's surface.

**Semi-fisheye:** Same as fisheye, except that newsprint may be read only by very slightly tipping the stone off from the line of sight along the vertical axis of the stone.

**Single Cut:** A stone whose crown consists of a single row of facets between girdle and table, and a single row of facets on the pavilion.

**VF:** Volume Factor. A mathematical constant, unique for each design, for determining a stone's volume from its width W. Volume=VF x WxWxW.

Polishing--Part 2
by Merrill O. Murphy

(Editor's Note: This article was written three or more years ago, and may not represent Mr. Murphy's current ideas)

Laps and Wax: Last month, I wrote about polishing with diamond particles, about ceramic laps and about the use of the new Facetron "Corian" lap with Carnauba-based waax applied before charging with diamond. The more I think about that thin wax coating, the more I believe it is an important concept. Facetron suggested any Carnauba wax-based automobile polish that did not contain abrasives or cleaning agents. I'm not sure that you can ever be sure of the abrasive, oxide-solvent or cleaning agents in automobile waxes. Perhaps a good, Carnauba-based, wood-workers paste wax might be better. Also it might be worthwhile to try the silicone-based waxes. Who knows what you might find effective? Obviously, the wax serves as a holding agent for the particles of polishing grade diamond. The particles, seated firmly in the wax layer, resist frictional pressures that would normally cause them to tumble erratically beneath the facet you are trying to polish. I wonder if the same technique would improve ceramic lap operation. I wonder, too, if a coat of wax would lock conventional oxide polishing agents to a frosted glass lap, a ceramic lap, or any other lap you might dream up. Try it with my blessing, but be aware that you may have one dickens of a time removing the wax from a porous llap surface.

Okay, let's get to the critique of early polishing theories that I promised.

Classical Theory: The Classical Theory of Polishing was advanced by Sir Isaac Newton (1642 - 1727), the English scientist who worked out various gravitational attraction formulas. Newton's theory of polishing holds that polishing is simply an abrasive process. Successively smaller abrasive particles, it says, make smaller and smaller scratches until scratch depth and width become too tiny to interfere with the passage of light. At this point, the surface is considered polished. Newton's contemporaries, Hooke and Herschel, supported this idea.

Classical Theory holds up well for the polishing of metals--if one makes allowance for the maleability factor in most metals. When malleable metals are polished, friction moves surface metal from microscopic high points and dumps it in tiny recessed. While it is true that some of the "moved" metal is totally removed from the piece being polished, a portion of it adheres to fill in the pits. The metal movement is, perhaps, more correctly refered to as burnishing. You can burnish lead or copper or silver easily by hand, using a smooth hard tool. But similar pressures are built up in conventional polishing.

When the Classical Theory is applied to hard and brittle substances, such as glass and gemstones, we run headlong into some incongruities. 1) Why will one polishing oxide polish one substance readily, yet fail miserably to polish another substance of similar hardness? 2) How can powdered sand (Tripolli), a mixture of quartz, feldspar, and minor other ingredients with a maximum Mho's hardness of 7, polish sapphire, hardness 9? It's slow, but it works.

The Bielby Theory: In 1901, Sir George Bielby, of Great Britain, published a first version of a polishing theory applying to metals. His second version,

published in 1903, extended the general theory to hard and brittle materials.

The Bielby Theory states that polishing with metal oxides (iron oxide, cerium oxide, aluminum oxide, etc.) results in extreme friction at the lapped surface. This friction, according to Bielby, causes melting and flow of an extremely thin outer layer of the surface, termed the Bielby Layer. Melting occurs, according to this theory, at minute high points and the molten material flows into microscopic pits, where it resolidifies.

In the 1950's Dr. L.E. Samuels repeated the key Bielby-Bowden experiments and backed them up with electron diffraction studies. Dr. Samuels reported no evidence supporting Bielby-Bowden. He, accordingly advocated a return to the Classical Theory of Newton, et al.

The 1960's saw a number of exhaustive tests attempting to prove or disprove the Bielby Theory. Among these was a very detailed series of experiments by Dr. C.D. Cornish and co-workers at SIRA Institute, Kent, England. The Cornish group studied the polishing of glass using various polishing oxides in water. Water pH was varied from acidic to basic, water temperature was varied, and glasses with differing silica content were tried. Electron microscope observations were made during successive phases of polishing. Cornish concluded that "no significant contribution to polishing was made by surface flow or redeposition of material on a scale greater than 50 Angstroms". A very insignificant amount, indeed!

More recently, Peter J. Crowcroft, Ph.D., repeated portions of the Cornish experiment, also using the electron microscope. His conclusions, supporting Cornish, were published in The Journal of Gemology, Vol. 17 (7), July 1981, pages 459 - 465 and republished in the Lapidary Journal for May, 1984. I suggest you see that copy of the Lapidary Journal for a more detailed review of the various theories of polishing and their demise.

And so the Bielby Theory is dead. Long live the king! Despite overwhelming evidence to the contrary, several authoritative, recent books on gem cutting have included that explanation for gem polishing. There are two probable reasons for this: 1) No acceptable new theory has been advanced, and 2) the Classical Theory fails in several areas when applied to the polishing of hard and brittle materials using metal oxides in water.

A New Theory of Polishing -- A new and viable theory of polishing is sorely needed. Such a theory would be extremely useful, not only to lapidaries, but to a number of technologies that deal with the polishing of hard and brittle materials. Thanks to a recent breakthrough in another field of research, a new theory is even now on the horizon. I had intended to address that new theory at this point. Events have taken a strange series of twists and turns, however, and I find myself unable to tell that story at this time. Perhaps I can tell you in another month--or another year. Otherwise, in March, I'll cover laps, lap hardness, polishing oxides and other polishing details.

From--TFG Newsletter, Oct. 1989

## The North York Faceting Guild

One of the guilds which trades publications with us, the North York guild in Toronto, Canada, headed by Bill Attwell, has been focusing on several areas of interest to faceters over the past year.

There was an interest in the use of an electrical charge on the stone while the stone was on the polishing lap; this is awaiting follow-up.

In a study of five pairs of double refractive stones, each pair of a different material, it was found that among those judging their appearance, approx. 70% preferred the stone whose table was 90° to the optical axis over the same stone whose table was not so oriented. That was about a year ago.

I just received more on the judging of these five pairs of stone, but the optical axis is not mentioned, so we might infer that it did not make the difference first reported. Some conclusions drawn in Jan. 1993, are as follows: "There is an obvious difference in optical performance between designs which has a direct relationship upon their popularity. The popularity of designs changes according to their viewing in stationary and revolving light. Designs which offer better scintillation despite poor brightness are more popular in revolving light (which it is assumed best approximates natural lighting and human movement) than designs which emphasize brightness. Designs which offer high brightness, at least in this experiment, do better in stationaary light than those designs which offer better scintillation in revolving light...."

I was asked if someone in our group would comment on the impact of various design features upon the optical characteristics of the finished stone. I have long considered writing about basic design principles--what to consider when creating a new design, or what to look for when choosing a design for your piece of rough. Here's what I personally consider important:

### Design Principles by Fred Van Sant

General Considerations:

First we should get out of the way those factors which do affect OP (optical performance) but are not inherent in the design itself. Mainly they have to do with the matching up of the design with your particular piece of rough and/or the changing of the sets of angles used. A design which may be fine on a large stone may not have good OP on a small one. While scintillation is an important stone feature, it can be carried too far. Points of light can become too small and color perception reduced. There is a certain size-level in the points of returned light at which it becomes difficult to perceive color differences. This will not happen if you select the design to match your stone size. It is something which is under the cutters control.

To reduce the complexity of this subject, then, we will separate it into two parts: 1) those features which are under the cutters control, and 2) those which are not.

After you have ground off the sharp projections and are ready to choose the orientation, the first consideration is the shape your finished stone will take. In the old days when OP was little understood, carat weight was the main consideration, but we are now free from the tyrrany of carat weight, and good OP, which translates into a beautiful stone, is more appreciated.

If, however, you are going to cut for maximum weight, you need not read any further; just let the shape of your rough dictate the design and improvise it.

Before looking at designs you will want to orient your rough by deciding where the vertical axis will run through it--where your table and culet areas will be. Your general H/W (height of stone divided by its width) should be about .7 or 70%. If you plan to use low crown angles your H/W can be as low as 60%.

The other factor in choosing a design is color. If your rough is medium to dark in color you are not going to get much dispersion, so you will probably use low crown angles to lighten the color and increase brightness. If your rough is of light color and low refractive index, such as quartz or beryl, you may want a normal or higher crown to enhance its color. If you have a high-refractive material such as clear or pale-tinted CZ you face two trade-offs as regards dispersion. If you go for maximum brightness--lower crown angles--you should expect to sacrifice some of the dispersion of color. Or if you go for a bright stone center on a round design using even-numbered culet indexing, you will not get as much dispersion around the table as you would with odd-numbered culet indexing, although with odd-numbered culet indexing your table will not be as bright. Decisions, Decisions !

What you, the cutter, can control:

So much for general considerations. Now about the things you have control over: Your main control of OP is in design selection to fit your rough, and how you orient your rough. In addition you can change angles on the crown or pavilion, or both, to adapt a design to your H/W or increase its brightness or deepen its color. Without getting into design alterations, there isn't much else you can do, so now let's get down to the meat of this

topic--design features.

## Design Features and Optical Performance

The general ideas which guide the designer in creating the design should also guide the cutter in the selection of a design.

What is it about the SRB (standard round brilliant) that makes it perform so well? **1)** the culet facets are at regular intervals around the stone so that there is a balance in reflection throughout a 360° circle. **2)** the pavilion angles are not spread out much--they are all close to optimum for returning light back up through the crown. In relation, the pavilion is as shallow as possible, so light is not lost through so much bouncing back and forth that it never gets back out. **3)** the area beneath the table is completely covered by culet facets or by the break facets which are close in angle to the culets. **4)** being round, there are no corners which funnel light or prevent even disbursement. **5)** the crown has a variety of facet sizes--large for the mains, medium size for the breaks, and smaller ones for the stars, making for a variety of flash size. **6)** the pavilion and crown angles are designed to maximize brightness and color dispersion.

As a design departs from the round shape, sacrifices and compromises must be made. Many good designs are the result of finding ways to keep as many of the SRB's features as possible in shapes other than round. The Barion idea is one such; my Squaround idea is another. Let's take the SRB's features one at a time and look at them in other shapes.

**1) Balance in culet indexing:** Where the indexing gap between culet facets is wider in some places than others, there is the chance of that part of the stone being darker. If the gap is large it is almost certain there will be a dark area. Look at all culet facets that come to a point as if they were for a round stone, and note deviations. For other sets of facets, circular balance of indexing is also desireable. If there is too close bunching of facets as to either their indexing or angles, it is likely that gaps are occurring between the bunches; also the bunched facets are difficult to cut.

In a triangular or square stone, I usually avoid having a facet coming off the corner on the pavilion at an index half-way between two sides; it makes for a deep pavilion. For example, on a square design, 96 gear, instead of a facet coming off the corner at index 12, it's better to have two facets bridge the corner by coming off that corner at indexes 10 and 14, or 9 and 15.

If the design is rectangular the same principle applies, but the two facets may have higher index numbers. High L/W ratio oblong shapes are the most difficult to design. For designs with LW over about 1.8 the point culet has to be abandoned in favor of a line culet or keel, and even indexing of culet facets becomes impossible.

In the Marquis shape, light tends to get funneled into the two sharp ends, so to avoid having broad flashes in the center of the stone and pinfire on the ends, the number of facets on the ends can be reduced (much depends on the particular design).

**2) Pavilion angle spread:** On round stones, the less spread in pavilion angles the better. Deep acorn-shaped pavilions like the Portuguese Cut tend to trap light. Viewers are not usually aware of the pavilion facet arrangement unless the design is such that a special effect is produced, so it is better to think of the pavilion only in terms of how it will enhance the view of the crown--how it serves as a light engine for the stone.

**3) Area beneath the Table:** Facets should be as close to the culet angle as possible. Avoid having facets with angles between 45° and 50° intrude into the area directly under the table, especially if they are opposite each other across the stone. They will usually send light out the back of the stone.

**4) Corners which funnel light:** Triangular and square designs with sharp corners tend to funnel light either into or away from the corner. Usually the corner will be darker rather than lighter. Sharp corners are about as far away as you can get from the SRB's corners, which are all the same angle. Making cut-corners or double cut-corners alleviates this problem somewhat.

**5) Variety in facet size:** Designs which produce a variety in the size of the flashes of returned light are in general more interesting (to me) than those which produce flashes all the same size. Especially boring is the stone which shows a zillion tiny pin-point flashes. If you're going to cut a design with a hundred of more facets, be sure to make it a big one. This is a subject which has not received the attention I think it deserves; I know of no study done on it. Variety can be obtained either by varying the size of facets on the pavilion, or on the crown, of both.

**6) Good Angles:** In spite of all we have learned about angles, designs are still coming out with goofy angles. Some designers appear to be happy with just about any old angles they happen to use when cutting a stone. You, the cutter, do not have to accept these angles. You can tangent-ratio them, or if they have too large a spread, ignore the design. The angle spread I refer to does not apply to oblong shaped stones where the pavilion break facets are made steep so that the culet facets can all

be close to the same angle, but to those designs where there is no compelling need to have a large spread in angles. sizes.

The final answers are not in on this subject, and perhaps they never will be, as to some degree a subjective judgement must be made regarding the best balance between various light characteristics, especially brightness and dispersion. I personally do not consider Brightness important in itself--if I want to look at a lot of white light I can shine a flashlight into my eyes or stare at a turned-on light bulb. For colorless stones, brightness is important only to the extent that those light-paths which the computer program uses are the same light-paths which return dispersed rays of color. To the best of my knowledge this has yet to be proven, but it may lie in the near future, as computers are approaching parallel processing capabilities. Currently, for single ray processing, sodium light is assumed--a yellow color approximately mid-range in the color spectrum. For colored stones, the brightness figure is a good guide to use in your decisions about angles.

I think that for colorless stones the quality of dispersion is most important. As color inherent in the stone gradually replaces dispersion, then it becomes the most important quality of the stone. That is, of course, my own subjective judgement. You may have a different idea about what is important in a cut gemstone; in any event it will be the buyer's dollar that will decide. If you look at the prices of cut stones for sale you will see that they agree with my values. You do not even see for sale single stones returning just white light.

# A Bulletin Writer's Joke

GET IT JEST RITE

I have a spelling checker,
It came with my WP.
It planely marques for my revue
Mistakes I cannot sea.
I've run this poem threw it,
I'm sure your pleased to no,
It's letter perfect in its weigh,
My checker tolled me sew.

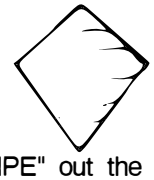
from Dinny's Doin's, et al, via The Paradise Gem 12/92, via Breccia, the Santa Clara Valley Gem and Mineral Society, Jan. 1993.

# CUTTING TID-BIT

by William J. Horton

(from the Midwest Faceter, Dec. 1991)

While working on a piece of cubic zirconia, I started having troubles with the final polish. This was a fairly large gem, so the facets were rather large. The scratches were on one edge of the facet, as in the figure.

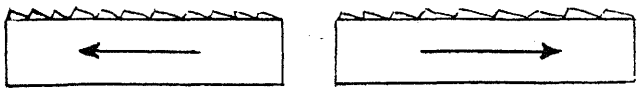


After trying to "WIPE" out the scratches without much success, I tried to "RING" the facet on one place on the lap. This also did not have much success. The term "RING" merely means to use one spot on the lap, without moving. Our usual method is called "SWEEPING". After thinking about these scratches for a while, I finally realized what was causing them. The mitered line of the facet was so sharp that it caused the edge to peel, for lack of a better word. In this peeling action, the material, which was rather minute, was tumbling across the facet between the gemstone and the lap. This was causing the little scratches. I reversed the direction of the lap, and lo and behold, the scratches disappeared. The reversal of the lap was just enough to finish the polish of that facet. If you think about it, the area that was peeling was now at the end of the facet rather than at the beginning. The minute particles were now going away with the swarf.

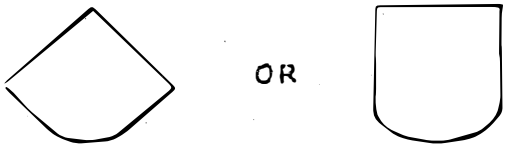
The same problem presented itself in polishing the table facet. This time the reversal worked, but I had scratches in other areas. This brought me to another trial and error. This time I was able to get a good polish without the scratches by using a kleenex as a mop. I would continue to sweep the facet on the lap but with my other hand I would wipe the lap with the kleenex. This apparently picked up the tiny particles as well as the excess of diamond, as the table came out as beautiful as you could wish. The plus was a beautiful polish; the minus was using up diamond compound. I am not against the usage of the diamond if I get the desired results.

I began thinking of the lap reversal operation. I could actually feel the lap pull as I reversed the operation, and could see it was cutting faster. This I have repeated time and again. I now make this a standard procedure for large facets. I have a theory. I believe the diamond lodges into the lap and polishes the facet as the lap rotates. I believe the diamond not only lodges directionally, but wears directionally. When the lap is reversed, you are

actually getting the results of a better cutting edge.



I am using a FAST LAP from RayTech. It appears to be a Resin bonded Zinc. The porosity of this lap lends to perfect use with diamond spray. It is a very forgiving lap. I have polished citrine with 100,000 diamond and make it look like sapphire. The diamond spray does not stay as long on this lap as it does on a ceramic lap, so requires frequent loading. But the results are far worth the extra diamond usage. I have always used a "SLAVE" piece of corundum for use as a roller to apply the diamond to the lap. I keep the slave in a small box with the diamond. I use a different slave stone for each grit of diamond, so as not to spread contamination to the different laps. You could dop up the slave stone should you desire. I don't because it could pick up some contamination. I think the box is better. Make the slave stone a cube, big enough to hold between your fingers. Round one edge of the cube and semi-polish the area to be used.




When you are rolling in the diamond, gently rock the slave stone back and forth from the center of the lap outward to the edge. I usually roll the diamond from center outward and back two or three times. It is better at this time to finish at the outer edge and wipe off the excess. When you feel the lap is dry or you see the little remnants of grey in your kleenex, it's time to reload the lap.

You may wish to "SCORE" your lap. It works better. This can be accomplished by using the rough edge of your slave stone. This scoring is like a spiral from the center outward to the edge. It only takes one score process for the life of that layer of the lap.

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Editor's Note: Reversing the lap is certainly important to remember when polishing. My own observations are that if the diamond is firmly embedded it will wear flat on top—parallel with the lap. Could the problem not lie in the slant of the grain in the crystal instead of the diamond on the lap? It seems that if there is a graininess in the crystal and you tried to polish with or against that grain, there might be a breaking-out of tiny particles. Reversing the lap should prevent that and result in a smooth polish. If you have experimented much, you have probably found that sometimes you can just move the mast so the lap attacks the stone from 90 degrees off its previous direction, rather than the 180 degrees difference you get from complete lap reversal.

One has to only observe the faces of crystals to see that direction is built into the crystal's structure. Some materials do not respond to change of direction of the lap, some do. Mass forms such as obsidian and glass do not exhibit cleavage planes, so it should make no difference which direction the lap attacks the facet. Others, having definite cleavage planes, may respond immediately to a change of direction.

The general rule is, if your facet does not immediately begin to polish, change the direction of the lap's attack on the facet's surface. Keep notes. If you have a problem polishing the pavilion around index 10 on a 96 gear, anticipate the same problem directly across the stone at around index 58 on the crown.

In discussing Mr. Horton's article with John Alden, John agrees that if the diamond particles are firmly embedded they will have to wear flat, but that possibly the leading edge of each diamond particle could get rounded-off, but leaving the trailing edge sharp, and when you reverse the lap it would polish faster because now the sharp edge of the diamond particles were doing the work. Sounds logical, but we will probably never get a really definitive answer until we have a series of pictures taken with an electron microscope of both lap and facet surfaces at various stages of polish.

I have heard other faceters refer to making a spiral when scoring a lap, but could never see why. If it is a benefit when running the lap one direction isn't it a detriment when you reverse the lap?

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We would like to list for you all the faceting competitions. Unfortunately, many of them are announced only a couple of months before they are to take place. For example, in the TFG Newsletter, January 1993, a Big Spring Prospectors Club single-stone competition was announced--to be held on March 6 and 7. In the same bulletin another competition held by the Gulf Coast Gem and Mineral Society on March 13-14 was announced. Since USACF and some other Newsletters come out only four times a year, these competitions sneak by us before we can even get wind of them. Even if these clubs don't want any outsiders to compete, surely they should want outsiders to know about their show so if they are in the vicinity they could attend.

From Australia, via Walt Carss - 1



## 1994 INTERNATIONAL CHALLENGE UP DATE - FEBRUARY 1993

1. First Official Entry. Our first official entry has been received from Hubert M. Rackets of Colorado, USA. Thank you Hubert, we look forward to your entry.

2. Possible Entries

We have heard from Walter Carss, the US Co-ordinator, that he has already had indications from a possible 24 US participants. We do not know as yet what the Australian involvement might be.

We have sent schedules to 6 other countries amd hope for responses from them. We have invited these past and possible entrants to try to raise at least 5 facetors to compete as a team for their country. Single entries, of course, will always be welcome.

3. Rules

One of our Australian past competitors has suggested that we draw attention to the fact that a number of the conditions have changed since the 1992 challenge. In particular relating to size.

4. Schedules

Further schedules are available to anyone interested from Rupert Pickrell, 1A Spurgin Street, Wahroonga, NSW 2076. Just sent 70c NSW, 90c interstate in stamps. Don't bother about envelopes. Overseas are free.

5. Visual Effect

To be read in conjunction with the note on page 7 of the Schedule. The judges will be using a small light (low voltage, approx. 21 candle power) located in front of the face and directed at the stone at an angle of about 5-10 degrees from the line of sight. They will expect to see patterns approximating to the patterns given with the diagrams. The committee has today (28 Jan 1993) checked two of the stones, B and C, using this technique and the visual patterns were very close. As in the note in the Schedule there would only be penalty if the pattern seen was very different - eg. if it was all dark or if one could see through the stone and perhaps read print readily. It is recognized that the faceting fraternity is far from agreement on brightness patterns and associated lighting and entrants can be assured that they will only be penalized for visual effect if the stone is seriously deficient. Assessment of visual effect is done in normal room lighting with a non-reflective background (so no light enters from below).

6. Checkerboard Barion

An entrant has reported that, using the angles given, his squares were not square and the lines making up the squares "wobbled" and were not straight. Today (28 Jan 1993) the Committee examined a stone cut from the instructions and the sixteen central squares were dead square, the lines were straight and the meets met. It is possible. As stated in Clause C4 and referred to in the note on page 6 the angles given are for guidance only and the cutter is free to modify them to make his stone conform with the design in the Schedule. Machine wear can be a major factor necessitating these angle modifications. Incidentally this stone was the one which gave the expected brightness pattern.

7. Square Cushion 012

The committee has been asked about crown facet h in the corners of the table, the suggestion being that the angle given - 30.77 degrees - is wrong. This cutter had to use an angle of 26.9 degrees to make his meets meet. Surely this is the art. Any variation of angle or facet size early in the cutting will result in the need for fine tuning of the angles later facets, highlighting the need for caution at all times when initiating a new facet.

8. Length/width Ratio

The committee thought it had dealt with this one but there has been a query as to how far a stone can be off set from the proscribed L/W ratio. We tried to clear this up in the note of page 7. Because the size of the finished stone is under the absolute control of the cutter it is expected that L/W ratios will be very close to the set figure.

eg. Suppose your piece of beryl is only big enough to cut a stone 7.9mm wide - still within the allowed limit (see C17). The ratio of 1.4 would give a length of 11.06 mm which the cutter would target as accurately as possible. C17 will permit this to go out to 11.16 mm (we rounded it off in the earlier note) and the L/W ratio would then be 1.412. We believe the judges will have no problem with such a ratio which should be readily achievable.

9. Other ratios than L/W

The diagrams include a lot of ratios which are irrelevant to us. Computers can't help doing this - given some figures they have to do everything that they can with them. We are only concerned with L/W - please ignore the other ratios.

10. Measuring of Stones

The judges will be using plastic dial vernier calipers which cannot damage the stones and with which 0.1 mm can be easily determined. These calipers will have been carefully checked against a standard master steel gauging block, surface ground for accuracy 0.001 inch (0.025mm).

11. Size "Eagle-Eye Cut"

We have had a letter from Piet van Zauten in the Netherlands, who has pointed out a lack of precision in the Schedule. The size is described in the Schedule as being "measured on the shortest axis of the outline shape". (C17)
Section D.10.2 of the Competition Rules shows clearly that that size is measured through the girdle plane. If we look vertically down on the "Eagle-Eye Cut" the problem is clear. The distance from Index 48 to Index 96 through the centre of the plan view of the stone as shown in the Schedule diagram is 38 mm - this line is at right angles to the length of the stone. However, if you move round to the long girdle facet, an axis or the G3 Preform indices through the centre of the plan view of the stone can be measured at 33 mm and could reasonable be taken as the "shortest axis of the outline shape" although this was not the Committees expectation. A stone cut having its shortest axis measured between the long girdle facets will be acceptable, but the cutter would be complicating his work because he must remember that the judges will be measuing the L/W ratio as shown on the diagram, namely the dimensions if the 24/72 indices axis and the 48/96 indices axis.

While the Schedule clearly allows the minimum size to be measured between the long girdle facets the Committee points out that entrants must use the 48/96 indices axis when establishing ratio. An entrant who has already cut his stone using the long girdle facets will not have it rejected provided that measurement conforms with C17, and L/W ratio is correct.

P.S. Walter Carss in his letter suggested that Australian facetors might well enjoy competing in the Northwest Facetors' Conference International Competition to be held May 22-23, 1993, in Calgary, Alberta, Canada. If you are interested, Frank Dickson has the particulars. (P.O. Box 938, Neutral Bay, NSW 2089 - Phone no. (02) 908 1061). This competition requires the cutting of a single stone.

BY WALTER CARSS

Several participants in the 1994 Australia-USA Faceting Challenge have written asking clarification of the size limitations outlined in the official schedule (Page 4 - C17). I have tried to clarify the situation in my replies to them, and thought maybe the following extract might be of interest to others in a similar situation.

I think Winston Churchill hit the nail right on the head when the declared that the United States and England were "two nations separated by a common language". The same is equally true (maybe moreso) of the United States and Australia. Despite their protests to the contrary, the Aussies do not speak any known form of English, but rather a language known as "STRINE", which is as close as they can come to "Australian" If there is trouble in interpreting any of the Rules and Specifications of the Schedule, particularly the "size" requirements of C17, it probably stems from this language problem. I guess one of my tasks as US Coordinator is to act as interpreter, so let's try to clear things up.

First, let's consider the stones to be cut from man-made materials (Section A - The Eagle-Eye Cut, and Section C - Checkerboard Barion.) The "shortest axis of the outlined shape" (read "width") is specified to be between 10 and 14 mm. Actually, you are allowed 0.1mm on either side to these dimensions, so that anything between 9.9 and 14.1 mm would be eligible, but don't tempt fate - stay well inside the 10 - 14mm range. Actually, the determining dimension really is the one marked "W" on the Section C design, but Section A is a special case. The Aussies had originally intended that the dimension marked "W" on the Eagle-Eye design should meet the 10-14mm criterion. However, wouldn't you know it, Pieter van Zanten of Holland wrote them, pointing out that , for Section A. the "shortest axis" was not the "W" dimension, but rather would be measured between the index-8 and index-56 girdle facets (or index-40 and index-88, if you wish). The Competition Committee concurred with Piet, and has ruled that either the "W" dimension, or the index-8 to index-56 "shortcut" may be used to satisfy the 10-14mm specification. Don't panic! If you stay comfortably within the 10-14 mm range, both dimensions will fall within specs. On my first try at the Eagle-Eye cut, for example, the "W" measures 12.1mm and the index-8 to index-56 route measures 10.5mm. So, with this special exception for Section A, cut your man-made entries somewhere between 10 and 14mm in width, with length as close to that required by the L/W ratio of the design as possible.

Now for the natural material stones (Section B - Cushion Rectangle Half Barion, and Section D - Square Cushion 012). The Bob Long design (Section B) is to be cut so that the "W" dimension, or width, is between 8 and 12 mm. (Again, with the 0.1mm tolerance, you could be between 7.9 and 12.1mm in width, but don't tempt fate or the accuracy of the Judges calipers - stay comfortably in the middle.) The length of the Section B stone should be as close to 1.401 times whatever width you ended up with as you can make it. Wouldn't you know it, Section D - Square Cushion 012 is a *special* case. It is what the Australian Rules define as a "Specified Size" stone, which has it's own set of judging points. Try to make your Section D entry EXACTLY 11mm in both the "W" and "L" dimensions as shown on the diagram. You are allowed a +/- 0.1 tolerance, but don't use it - you'll need that much to allow for the inaccuracy of the Judges calipers (and yours).

After reading the above, it's not at all clear that I have clarified anything, but it's not a simple problem. Let me try again by summarizing:

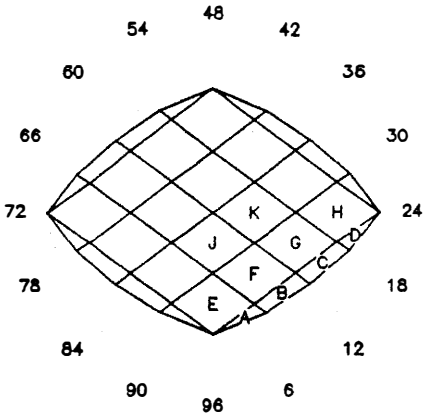
Section A - The Eagle-Eye Cut. Try to make your stone around 12.5mm in the "W" dimension so that the index-8 to index-56 dimension is over 10.0mm. Make your "L" dimension as close as you can come to 1.123 times the "W" dimension you have chosen.

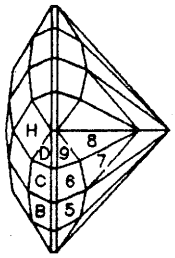
Section B - The Cushion Rectangle Half Barion. Make the "W" dimension of your entry between 8 and 12mm, preferably around 9mm. Make the "L" dimension as close as you can to 1.401 times whatever width you have come up with.

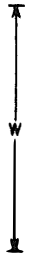
Section C - Checkerboard Barion. Make both the "L" and "W" dimensions between 10 and 14mm, preferably around 11mm.

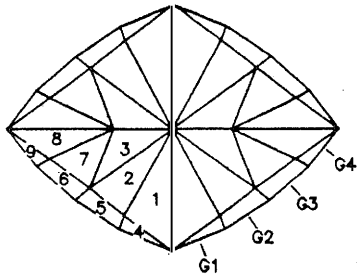
Section D - Square Cushion 012. Cut this stone *EXACTLY* 11.0mm in both the "L" and "W" directions.

**HAPPY CUTTING!**

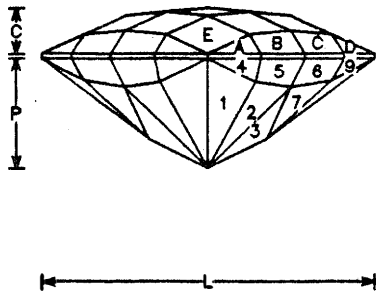



"A Girl's Best Friend" (GIRLBEST.GEM)
by Robert W. Strickland
Crown Top View by Fred W. Van Sant
for Diamond Dilemma Contest




Angles for Quartz, R.I. = 1.54
68 facets + 16 facets on girdle = 84
2-fold, mirror-image symmetry
96 index
L/W = 1.335
P/W = 0.451 C/W = 0.184
H/W = (P+C)/W+0.02 = 0.655
P/H = 0.689 C/H = 0.281
Vol./W^3 = 0.248

PAVILION

| | | |
|---|---|---|
| 1 | 42.63 | 03-45-51-93 |
| 2 | 41.35 | 08-40-56-88 |
| 3 | 40.00 | 10-38-58-86 |
| G1 | 90.00 | 06-42-54-90 |
| 4 | 58.15 | 06-42-54-90 |
| 5 | 58.68 | 09-39-57-87 |
| 6 | 57.88 | 11-37-59-85 |
| 7 | 41.34 | 12-36-60-84 |
| 8 | 39.73 | 18-30-66-78 |
| G2 | 90.00 | 09-39-57-87 |
| G3 | 90.00 | 11-37-59-85 |
| 9 | 56.86 | 14-34-62-82 |
| G4 | 90.00 | 14-34-62-82 |

CROWN

| | | |
|---|---|---|
| A | 55.77 | 06-42-54-90 |
| B | 53.25 | 09-39-57-87 |
| C | 52.17 | 11-37-59-85 |
| D | 51.28 | 14-34-62-82 |
| E | 31.36 | 96-48 |
| F | 22.42 | 07-41-55-89 |
| G | 20.26 | 13-35-61-83 |
| H | 24.51 | 24-72 |
| J | 7.00 | 96-48 |
| K | 5.25 | 24-72 |

This beautiful design by Robert Strickland won the first place 25$ award in the Diamond Dilemma Design Contest, announced in this newsletter, February, 1992. The contest required the designer to match the crown pattern as closely as possible. The crown pattern was given without any indexing--just the lines. Robert has accomplished this goal better than I had expected anyone could. I asked him, as winner, if he would do the pavilion for it, and as you can see if you study it, he has done a fine job on that also. This unique design is destined to become a classic. --FVS--

From the New Mexico Facetor, Jan. 1993

# STONEY STATEMENTS

## GEM STUFF

By M.A. (Al) Huebler, GG, Guild Gemologist, New Mexico Faceters Guild

On The Etiquette For Gemstone and Gem-collecting viewing.

While this article has been written to focus on faceted gemstones, it applies equally well to faceting rough material, cabochon gems and rough, and to mineral and fossil special items and collections.

Gemstones, fine, rare and common, are all things of beauty, are fragile, and, to a large degree, things originated in nature. Depending upon species and variety, they can be hard or soft, tough or brittle, cleavable or not, and subject to breakage, fracture and abrasion. Considering their source, and the time and expense necessary to fashion them, all require TLC (tender loving care) throughout their entire life. Most of us involved in the gem-cutting and/or collection fields understand this to be true. But most of the lay public, the philistines who view our product, do not.

The handling of gemstones, by anyone, can under certain (many) conditions and in many environments, be extremely dangerous. This is true, not only for the stone, but also for the person handling the stone in order to fully observe its detail. Let's examine this statement a little more closely.

For example, you, the cutter at a faceting demonstration, place a finished stone on the table out in front of your machine, to be viewed in a "non-protected" manner by all who come by to observe your cutting demo. Your machine rests upon a table that sits on a concrete floor. The viewer may or may not be a potential faceter and a possible recruit for Guild membership. This adult viewer does not yet know of and understand a gemstone's vulnerability to physical damage. He or she can only assume, in ignorance, that the stone, being rather small, is to be lifted up for examination and easy viewing. So he does, and, a moment later, drops it onto the concrete floor. When retrieved, the stone is found to be badly damaged! You, the cutter, can tell the viewer to "worry not," that it was only an inexpensive stone anyway, or offer some other assurance that he was not at fault and should not be overly concerned. However, you have caused this person, no matter what you might say, to immediately develop a heavy emotional trip, a bad grief/guilt conscience and super embarrassment!!! Do you really think this person will, in the near future, if ever again, get over this shame and want to get close to a gemstone? Probably not! And if you think the impact is bad on an adult, just consider the effect on a viewing child!!

The bottom line here is that you know better and should not have put the uninformed in jeopardy. You, the knowledgeable one, must take the full responsibility for the protection of your gemstones, individually and as a collection! It is for this reason that gemstones are not left lying around, but rather, are usually kept in secure display cases. You are doing nobody a favor by putting him or her, unknowingly, in jeopardy. That is why there are "touching rocks" and there are gemstones -- and "never the twain shall meet." When I first joined the Guild, over six years ago, and initiated the "Show and Tell" program at our meetings, I purchased a locking, glass-top display case to protect the program's gem display for the evening. It cost me, with the associated external lighting, over $75.00, but we have never had a damaged or lost stone!! With its excellent lighting, there has been no need for our members to handle stones.

For a moment, let's look at another very common, somewhat parallel, situation. You invite me over to your house to see some new rough that you just purchased and to view two new faceted stones that you recently cut. You are very eager to have me look at, and enjoy, this material with you. During the excitement of this superb moment, two things often happen. You put your gems in jeopardy of damage and I, losing my calm and awareness of good protective practices, get maneuvered into a position of financial and emotional jeopardy by the excitement of the experience. And one of the new stones snaps out of the three-prong stone holder and falls onto the concrete floor under our feet. (I was holding the stone holder.) So, now who is responsible for this predicament and the chances of damaged stones? The answer, I believe, is both of us, equally. We are both knowledgeable faceters and each must be alert to the damage or loss possibility during handling of gem materials. It is my responsibility to know the proper way to handle and protect gem materials, and to immediately bring to your attention a less than satisfactory situation. I will refuse to examine gems that are offered up for my viewing in a haphazard way.

## STONEY STATEMENTS

From the New Mexico Facetor, Jan. 1993

Towards the end of assuring gemstone and gem-rough protection on the part of all concerned, and the continuation of good friendships, I strongly suggest practice of the following steps:

1. Don't teach people (and mainly youngsters), by inappropriate or thoughtless actions, to pick up cut gems with their fingers. Teach them to look and not touch unless, when you feel conditions are right you invite them to handle your material. To drop a stone can, well be, to destroy it! Don't hesitate to correct people in a kindly manner if they touch or endeavor to pick up your stones.

2. Finger oils not only immediately destroy the brilliance of the stone, but make the stone slippery and subject to dropping. Oils can also discolor stones of soft, porous materials and stones having open surface blemishes.

3. Use lint-free white gloves when placing cleaned stones in a showcase. Be sure that the case is fully locked or otherwise secured before leaving it unattended.

4. Don't touch or pick up another person's gemstone(s) without his or her permission.

5. Display stones under a protective covering of glass or rather heavy-weight clear plastic. Do not place them in a position that promotes handling. On many occasions, I have found people using the light from within (or associated externally with) a showcase to examine external items of gem material--large pieces of rough, heavy fossils, etc. This they do, without concern, by holding this heavy material above the showcase glass front or top panel. An accident would have the heavy material breaking through the glass, crushing the stones within the case! Common sense says not to do these thoughtless things, but even knowledgeable people have to be corrected on occasions!!

6. Keep control of your materials. When presenting stones for viewing, you hold onto them. Do not physically turn them over to untrained people.

7. Pay attention to the floor material over which stones and rough are handled. Floors should be carpet-covered with a low pile, non-shag material. Stay away from concrete, wood, hard tile, and linoleum. Stones falling on these items can easily be damaged. A light gray or tan carpet color is best if you want to quickly find a small, dropped stone.

8. When possible, show your stones in and over a jeweler's lined and padded display tray. These trays are about 15 inches long, 8 inches wide and 1 inch high at the edges. The removable padded liner-board come in white, black, etc. White seems the best for showing off transparent colored stones (even the colorless ones). A jeweler's gemstone display pad is the next best thing, but not near the protection of the display tray!

9. Do not leave your stones, for long periods of time, in three-and four-prong, wire stone holders. These can damage soft stones, and by temperature change of the wire prongs, send a stone flying across the room.

10. Be very careful when picking up stones in gem tweezers or tweezers that are a part of gemological test equipment. Never use locking tweezers. Tweezers, of all kings, have a great propensity for snapping your stones all over the room. Beware of some of the new Asian-made gem tweezers. They have a very hard, rough-surfaced tip. While the stone does not often shoot out of the tweezer, it may get badly scratched!! Really, the best way to pick up an individual stone is by means of a lint-free, gloved hand. Rubber finger cots, from the drug store, are also used occasionally. A small metal gem scoop should be used for melee and other very small material.

11. For protection, stones should be stored in gem papers (made for this purpose, or you can make your own out of non-sulfured paper) or in plastic, covered boxes. Both papers and the plastic boxes should be enclosed in appropriate, covered gem cases. Velvet-lined, grooved boxes and Riker Mounts can also be useful.

12. Use a jeweler's gemstone cloth, Kimwipes lint-free paper, brushes, alcohol, etc. to keep your stones clean. Clean stones are easier to handle than dirty, greasy ones, and they certainly view with much more beauty.

13. Remember, placing a gemstone where it can be carelessly handled by inexperienced people is like dangling a carrot in the face of a donkey. It's going to get grabbed. It acts as an attractive tease!

## COMING ATTRACTIONS 1993

• The Calgary Faceters Guild will host the 1993 Northwest Federation "International" Faceters Symposium, Calgary, Alberta, Canada, **May 22-23.** For information write Violette Merkeley, 2823 Canmore Road NW, Calgary, Alberta, Canada T2M 3J7 Phone: (403) 289-4175

•Second Annual Rocky Mountain Faceters Symposium.
May 14--Friday evening dinner.
May 15--Speakers C. Covill, Norbert Kaufeld, Howie Whiting, R. Strickland, Richard Ochsner, Louis Natonek, & Ernie Hawes.
May 16--field trip to Harding Mine.
Call or write Betty Annis,
11112 Orr NE, Albuquerque, NM 87111
Phone: (505) 299-1682

•South Central Fed. of Mineral Societies Arlington, Texas, June 18-20

•California Fed. of Mineral Societies Ventura, Calif., June 25-27.

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### Designers Competition

The New Mexico Facetor has announced a new facet design competition for 1993 for the best Rectangular Cushion design. Rules:
1. L/W must be 1.2 or greater.
2. It must be a cushion pattern.
3. Design must be original and not previously published prior to submission.
4. Contest runs through Jan. 1994. Multiple entries OK. Mail entries to: Design Contest, The New Mexico Facetor 6800 Luella Anne NE, Albuquerque, NM 87109
(your editor will not enter this one.)

## DIAMOND SMUGGLING

by Jean Maudsley
(from The Transfer Block, Jan. 1993)

Have you heard the latest on diamond smuggling? Lured by the promise of quick wealth, thousands of Angolans, Zairins, Belgians, and even Americans have poured into Angola's remote Lunda Norte province, by air, land, and sea. They swarm like ants to tunnel into the sunbaked desolate land, looking for a treasure in diamonds. They steal, murder and cripple their neighbors to gain a desirable polition to dig.

Of course this primitive mining is illegal, but the hoards labor and sweat to scoop up the gravel, put it through sieves and wash it in the local river. They literally pick out the diamonds that have come to the surface. This type of diamond mining has never been in existence in the past. It is illegal, but can we blame these foragers for gambling on a dream of a secure future?

Legislation enacted in the past year in Angola permitted Angolans to trade in uncut diamonds. This was intended to soak up rough stones that people had illegally hoarded down through the years. Instead, it further instigated the rush of miners to Lunda Norte. The people live in corrugated shacks and the law of the region is wild and violent. Each day it becomes easier to unbad illegally dug diamonds.

To further complicate the problem, at this same time, Soviet Union smuggling is on the rise. For years the communist party pilfered diamonds through mine operations in Yakutia. Now these diamonds are making their way into Western salesrooms. Illegally acquired Russian diamonds are showing up in Belgium and other European diamond centers.

De Beers, the diamond cartel known for their control of the diamond market is beginning to feel the results of this smuggling. Will De Beers be able to maintain their control of the diamond market, or will the market be flooded with diamonds and their value drastically reduced?

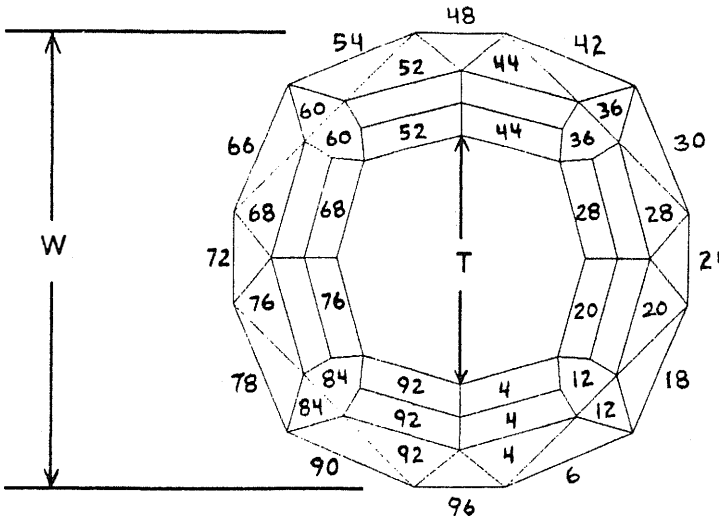
De Beers control is shaky. They may have to buy up Angolan and Russian diamonds to keep them out of circulation. De Beers is well established and has rich investors, but its investors are concerned. Could it be that the diamond will lose its magic attraction because of the glut on the market and lose its value? Maybe the market and allure for colored stones will rise and take over the revered place of the lofty diamond, and a new trend will be set.

The Charlie Moon Cut
Gear= 96 Angles for Corundum

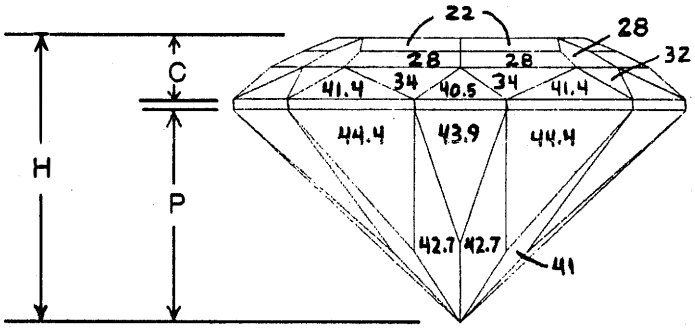
| Crown: | Angle | Indexes |
|---|---|---|
| ----- | girdles | ----- |
| 1. | 4 at 40.50° | 96,24,48,72. |
| 2. | 8 at 41.39° | 6,18,30,42, 54,66,78,90. |
| ----- | others | ----- |
| 3. | 4 at 31.97° | 12,36,60,84. |
| 4. | 8 at 34.00° | 4,20,28,44, 52,68,76,92. |
| 5. | 8 at 28.00° | same as set 4. |
| 6. | 4 at 28.00° | 12,36,60,84. |
| 7. | 8 at 22.00° | same as set 4. |

Table Area = 28.7 %
C/W = .1372
P/W = .4705
H/W = .6077
VF = .2203
GVF = .00406

This is an ECED design.
Preform as a 'round' on the girdle indexes shown.





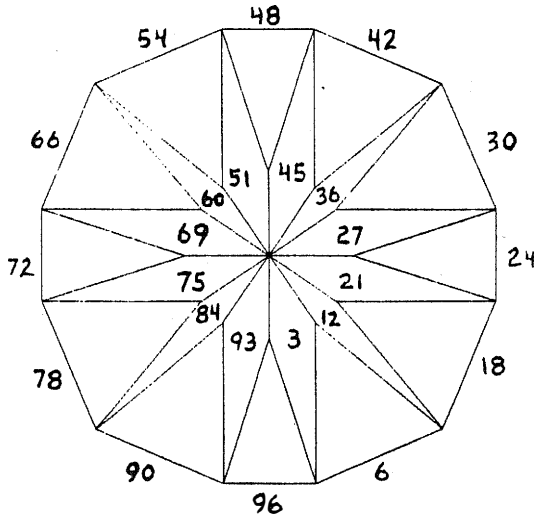




Optional Preform:
Maximum Cone Angle for CAM Preform = 38.5°

CAM Preform:
Cut 12 at 41.00° on sets 1 and 2 pavilion indexes.

| Pavilion: | Angle | Indexes |
|---|---|---|
| ----- | girdles | ----- |
| 1. | 4 at 43.90° | 96,24,48,72. |
| 2. | 8 at 44.41° | 6,18,30,42, 54,66,78,90. |
| ----- | culets | ----- |
| 3. | 4 at 41.00° | 12,36,60,84. |
| 4. | 8 at 42.70° | 3,21,27,45, 51,69,75,93. |

Designed by Fred W. Van Sant



The Bettie J Cut
Gear = 96
Angles for Corundum

Crown:

| | | | | |
|---|---|---|---|---|
| 1. | 1 | at | 41.39° | 96. |
| 2. | 2 | at | 48.22° | 10,86. |
| 3. | 2 | at | 47.35° | 16,80. |
| 4. | 2 | at | 44.57° | 22,74. |
| 5. | 2 | at | 46.89° | 39,57. |
| 6. | 2 | at | 50.21° | 45,51. |
| 7. | 2 | at | 40.00° | 9,87. |
| 8. | 2 | at | 39.14° | 17,79. |
| 9. | 2 | at | 38.22° | 21,75. |
| 10. | 2 | at | 40.22° | 40,56. |
| 11. | 2 | at | 42.15° | 44,52. |
| 12. | 2 | at | 34.35° | 7,89. |
| 13. | 2 | at | 36.00° | 18,78. |
| 14. | 2 | at | 36.00° | 20,76, |
| 15. | 2 | at | 37.97° | 41.55. |
| 16. | 2 | at | 38.95° | 43,53. |
| 17. | 2 | at | 27.69° | 8,88. |
| 18. | 2 | at | 28.89° | 17,79. |
| 19. | 2 | at | 19.06° | 24,72. |
| 20. | 2 | at | 24.18° | 39,57. |
| 21. | 2 | at | 21.21° | 46,50. |
| 22. | 2 | at | 35.82° | 3,93. |

Table Area = 32.7 %
L/W = 1.126712
T/W = .5891
C/W = .1623 A/W = .24146
P/W = .4897 B/W = .310859
H/W = .6720

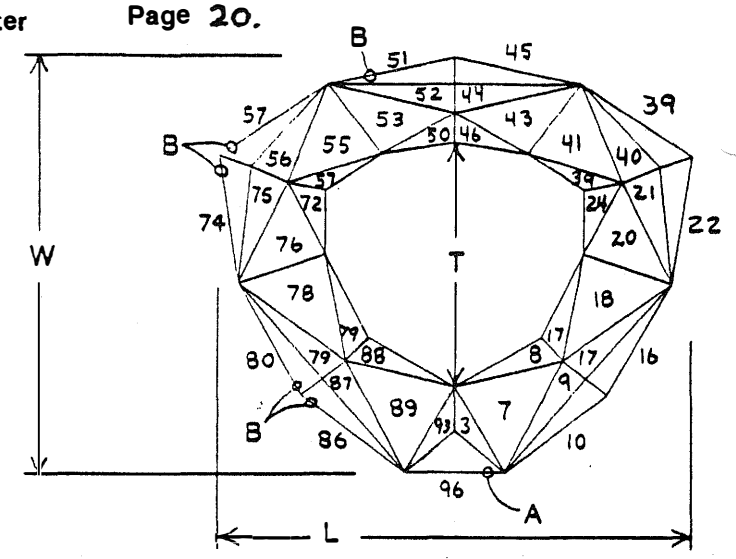
Cone Angle = 36.00°
CAM Preform:

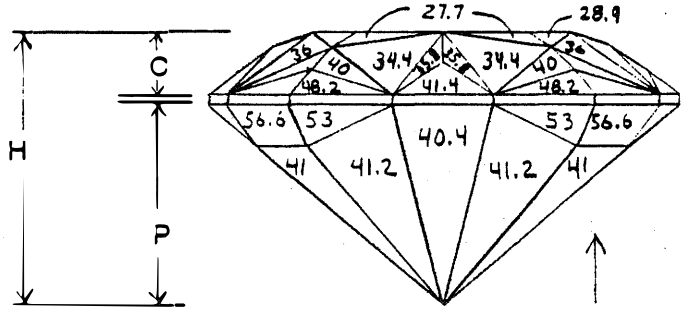
| | | | | |
|---|---|---|---|---|
| 1. | 1 | at | 37.09° | 96 |
| 2. | 2 | at | 39.38° | 10,86. |
| 3. | 2 | at | 40.40° | 16,80. |
| 4. | 2 | at | 39.19° | 22,74. |
| 5. | 2 | at | 42.67° | 39.57. |
| 6. | 2 | at | 46.26° | 45,51. |

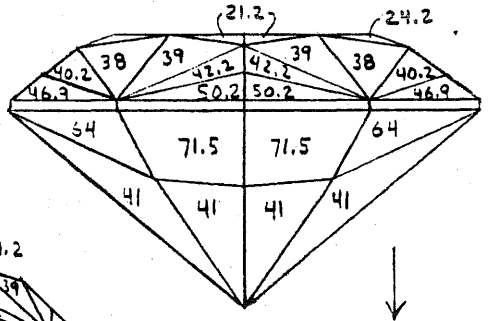
Pavilion: Angle Indexes

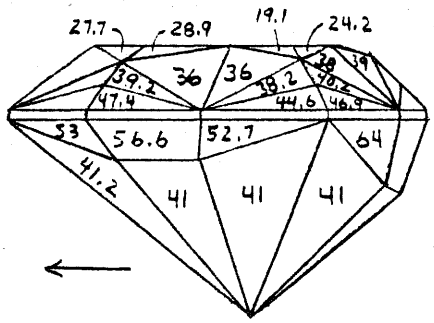
| | | | | |
|---|---|---|---|---|
| ----- | girdles | ----- | | |
| 1. | 1 | at | 40.40° | 96. |
| 2. | 2 | at | 53.00° | 10,86. |
| 3. | 2 | at | 56.57° | 16,80. |
| 4. | 2 | at | 52.73° | 22,74. |
| 5. | 2 | at | 64.00° | 39,57. |
| 6. | 2 | at | 71.51° | 45,51. |
| ----- | culets | ----- | | |
| 7. | 2 | at | 41.24° | 8,88. |
| 8. | 8 | at | 41.00° | 16,24,34,44, 52,62,72,80. |

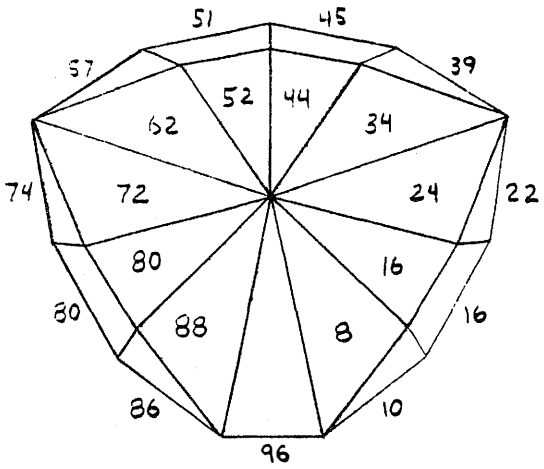
Designed by Fred W. Van Sant



## LATE BREAKING NEWS -- Editor

I was on my way to the copier feeling all-caught-up and smug, with my paste-up additions ready to make the master sheets. Stopping off at the post office--wouldn't you know it! --there was a new Facet Talk from Australia, a new issue of The New Mexico Facetor, a new issue of The Transfer Block, and five back-issues of FACETS which they'd forgotten to send plus 15 pages of definitions in a glossary compiled by J. A. Hoeschen for the CWFG. Suddenly I didn't feel so caught-up any more. Well, the pages were all finished and numbered so what could I do? I'll just have to give you the bits and pieces.

First off, the shocker from Australia. After the meeting on April 10 this year, Peter Collins is resigning from all offices in the AFG. These include President, Editor, 1993 Competition Organizer,and Seminar Coordinator--a lot for one person! As reasons he cites almost unanimous opposition among those with whom he has to work to the six-point platform which he believed was the basis for his election last September. He also cites personal attacks. I can see from his agenda that some of the bureaucracy would resent the added work, loss of perks, and increased accountability which the platform mandated. Every organization I've been in has a certain Work/Pleasure ratio. That's the ratio of how much work a person is willing to do in return for the pleasure he gets out of it. Among a bunch of old, tired, and retired faceters, that ratio can be pretty low. Peter's Skill-Promotion System has also been dropped. So the Australians are not yet ready to move up to that level of organization. The basis for it is a set of uniformly-trained judges and a well-defined judging system.

Let me explain. In many sporting events here in the USA there are defined proficiency tests one must pass through before achieving a rating within a set of class ratings. In some sports the competition itself can be used to establish the ratings; in skiing, for example, winning the race is in itself proof of competence. In other sports, especially judged ones, a separate set of tests must be used. The United States National Figure Skating Association has long had separately judged proficiency tests for rating skaters. You have to have passed the required proficiency test in order to enter any given level of competition. It is made difficult, sometimes taking years to move from one level to the next. A great deal of pride goes with the accomplishment. In faceting if promotion is based merely on winning contests, then if the field is low one could move up to the next level on a stone which achieved a score of only 59, if all the other scores were lower.

The faceters in the US are nowhere near ready for a proficiency-test system. It takes a well-established national organization to carry it off, and a lot of dedicated people. And it takes money. Ice-skating judges are paid all travel, meals, and hotel expenses for their work. US Faceters are not ready or willing to even establish a National Guild. That has to be done before we can have uniform judging, and you have to have uniform judging before you can have a proficiency-test system. Among faceters we have too many tired old men; what we need is more beautiful young women faceters to liven things up.

Perhaps I am partly to blame for Peter's troubles, as I encouraged him along this line, thinking the AFG was much better organized than it really was, or not realizing what their work/pleasure ratio was. John Broadfoot will take over as president.

On to other news. ANGLES reports that Paul Billet won the Facetron competition held in So. Calif. last September. Nice going, Paul.

**Additional terms** for our Faceting Dictionary, inspired by Hoeschen's Glossary:

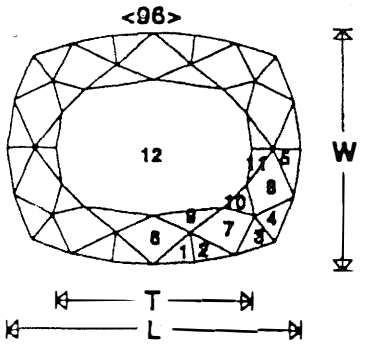
**Barion Cut:** A type of cut that retains the brilliant type culet area by having steep half-moon facets hanging down from the girdle. The crown is often a step-cut.

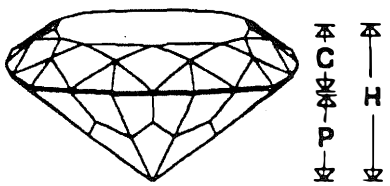
**Hardness:** A material's resistance to scratching or abrasion.

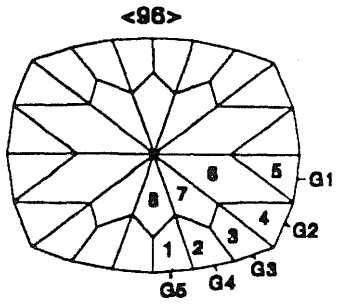
**Mohs Scale:** The most commonly used scale for approximating the relative hardness of minerals: 1-talc; 2-gypsum; 3-calcite; 4-fluorite; 5-apatite; 6-orthoclase; 7-quartz; 8-topaz; 9-corundum; and 10-diamond.

There are many other good terms in the glossary, but we are deliberatly omitting all terms dealing with crystal structure, geology, and other technical aspects, as these are defined in text books.

**Mining Giants Join Great Diamond Rush** (from The Transfer Block, March 93, by Lain Jenkins) A land rush on a scale over-shadowing anything since the Alaskan gold rush of the 1890's is underway in northern Canada. But instead of private prospectors, global corporate giants, including Britain's RTZ, Australia's BHP and the South African giant De Beers, are racing to stake out huge areas of the frozen land north of Yellowknife in a scramble for diamonds...




# 08.091 Easy Cushion #2

96 Index L/W=1.250 P/W=0.511 C/W=0.146 T/W=0.832 H/W=0.677
73+20 facets Vol =0.309 $W^3$

## Designer: Long, Robert H

This design is part of the "Easy" series which is a variation of "Meetpoint". What might be considered a CAM preform (if it stood alone) is incorporated into the design cutting sequence and cuts the break facets as well as the outline and girdle. By cutting to a temporary meet point with "break" angles, more depth is needed at this stage than is needed after the "mains" are cut, however this disadvantage is offset by the simplicity of the cutting sequence.

### PAVILION CUTTING DATA

| Step/Angle | | Bearing Index | Comment |
|---|---|---|---|
| P1 | 47.0 | 01-47-49-95 | Facets P1 thru P5 are cut to a TCP. Together with the girdle |
| P2 | 46.2 | 03-45-51-93 | facets G1 thru G5 they create the level girdle line and lay in all |
| P3 | 44.6 | 05-43-53-91 | of the break facets. |
| P4 | 40.3 | 18-30-66-78 | |
| P5 | 40.8 | 22-26-70-74 | |
| G1 | 90.0 | 22-26-70-74 | Establish size (length) and girdle location. |
| G2 | 90.0 | 18-30-66-78 | Level girdle |
| G3 | 90.0 | 05-43-53-91 | Level girdle |
| G4 | 90.0 | 03-45-51-93 | Level girdle |
| G5 | 90.0 | 01-47-49-95 | Level girdle |
| P6 | 39.0 | 20-28-67-76 | Meet P4-P5-G1-G2 |
| P7 | 43.4 | 04-44-52-92 | Meet P3-P4-P6 |
| P8 | 45.0 | 96-48 | Meet P1-P2-P7 |

### CROWN CUTTING DATA

| Step/Angle | | Bearing Index | Comment |
|---|---|---|---|
| C1 | 37.2 | 01-47-49-95 | Fix girdle thickness. |
| C2 | 37.2 | 03-45-51-93 | C1 thru C5 level the girdle. |
| C3 | 36.7 | 05-43-53-91 | |
| C4 | 38.7 | 18-30-66-78 | |
| C5 | 40.2 | 22-26-70-74 | |
| C6 | 35.0 | 96-48 | Meet C1-C1-G5-G5 |
| C7 | 35.0 | 04-44-52-72 | Meet C2-C3-G3-G4 |
| C8 | 35.0 | 20-28-68-76 | Meet C4-C5-G1-G2 |
| C9 | 28.3 | 02-46-50-94 | Meet C1-C2-C6-C7 |
| C10 | 22.0 | 12-36-60-84 | Meet C3-C4-C7-C8 |
| C11 | 27.9 | 22-26-70-74 | Meet C8-C5-C5-C8 |
| C12 | 0.0 | Any | Table |

COURTESY OF

*The New Mexico Facetor - March, 1993*

# USFG NEWSLETTER

JUNE 1993

USFG NEWSLETTER
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